

Resonator

Piezoelectric Resonator (4 to 16 MHz)

FAR Family (C4 series P/Q type) For Motor Application

■ DESCRIPTION

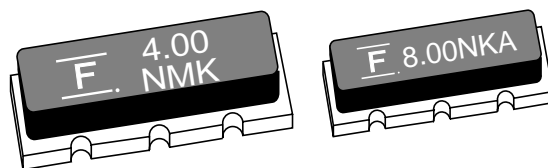
Fujitsu resonators C4 series (P/Q type) feature single crystals with a high electro-mechanical coefficient (LiNbO₃: lithium niobate), the result is very compact packaging.

C4 series (P/Q type) with built-in capacitors for exclusive use in microcomputer clocks, and this series is chip type device for surface-mount and suitable for motor application due to its high reliability package.

■ FEATURES

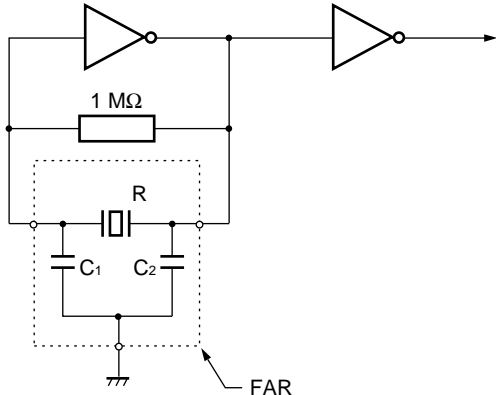
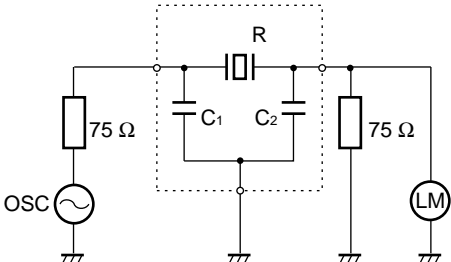
- Wide frequency range in 4 to 16 MHz
- Suitable for microcomputer clock
- PCT (121 °C, 2 atms, 96 hours) is guaranteed for Motor application.
- Emboss-typed pack for automatic mounting
- Superior shock and vibration resistance, preventing damage during automatic mounting

■ PACKAGE



FAR Family (C4 series P/Q type)

■ STANDARD CHARACTERISTICS

| Parameter | Series | C4 series (P/Q type) | Remarks |
|--|--------|---|--|
| Material | | Lithium Niobate (LiNbO ₃) | |
| Frequency | | 4 to 16 MHz | |
| Standard frequency | | See "■ Standard Frequency." | |
| Initial frequency deviation | | ±0.5% (M) | The ±0.3% (K) version can also be produced. |
| Temperature characteristic (-40°C to +105°C) | | ± ^{0.9} / _{1.0} % (M) | Reference temperature: +25°C |
| Capacity of built-in capacitor | | 20±8 pF (standard) | 10±4 pF, 30±8 pF are also available. Capacity is specified by Fujitsu, considering matching data with applied IC (mainly microcomputer). |
| Aging stability | | Within ±0.1% | For ten years at room temperature |
| PCT | | 96 hours guaranteed | Unstaturated PCT: 121°C 2 atmospheric pressures |
| Operating temperature | | -40°C to +105°C | |
| Storage temperature | | -55°C to +105°C | |
| Standard measuring circuit | | <ul style="list-style-type: none"> Resonant frequency  <ul style="list-style-type: none"> 4 MHz to 10 MHz IC: MB84069B×2 10 MHz to 16.0 MHz IC: MC74HC04×2 V_{CC}: 5 V DC R: Resonator C₁, C₂: Loading capacitors (built-in) <ul style="list-style-type: none"> Serial resonant resistance  <ul style="list-style-type: none"> R: Resonator Measuring instrument: Network analyzer | |

FAR Family (C4 series P/Q type)

■ STANDARD FREQUENCY

| Standard frequency (kHz) | Package size | Resonant resistance |
|-------------------------------------|--------------|-----------------------------------|
| 4,000 | P | 150 Ω max. (Symbol: 01) |
| 8,000 10,000 12,000 16,000 | Q | 75 Ω max. (Symbol: 02) |

- Notes:**
- Fujitsu can also develop applicable device in addition to standard devices if its oscillation frequency is from 4 to 16 MHz.
 - Resonant resistance of the part other than standard, Fujitsu should specify its resonant resistance according to applied frequency. (See “• Frequency and standard resonant resistance.”)
 - Frequency and standard resonant resistance

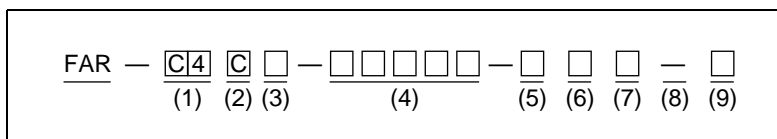
| Frequency | Standard resonant resistance |
|-------------------|-------------------------------|
| 4.00 to 5.99 MHz | 150 Ω max. (Symbol: 1) |
| 6.00 to 16.00 MHz | 75 Ω max. (Symbol: 2) |

■ NOTES ON USE

- Handle carefully
- Solder under the following conditions.
5 seconds max. at 230°C (PCB)
Recommended preheating is 150°C for one minute in order not to apply extreme heat to the resonator.
- Avoid extreme fluctuations in temperature.
- There is no specific direction in resonator mounting.
- Oscillation data should be examined when used in oscillation circuit with microcomputer or other ICs.
- This is for reflow solder, not for flow solder.

FAR Family (C4 series P/Q type)

■ PART NUMBERING SYSTEM



(1) Series

| Series | Single crystal | Capacitor |
|--------|--------------------|-------------------------|
| C4 | LiNbO ₃ | With built-in capacitor |

(2) Package Type

| Specification | Type |
|---------------|------|
| C | CHIP |

(3) Package Size

| Specification | Size |
|---------------|-------------------------|
| P | Large (4.0 to 5.9 MHz) |
| Q | Small (6.0 to 16.0 MHz) |

(4) Frequency

(Example) Unit: kHz (Specify in five digits.)

| Frequency | Specification |
|-----------|---------------|
| 8.000 MHz | 08000 |

See “■ Standard Frequency”.

(5) Initial Frequency Deviation

| Specification | Deviation |
|---------------|-----------|
| K | ±0.3% |
| M | ±0.5% |

(6) Built-in Capacitor

| Specification | Capacitance |
|---------------|-------------|
| 0 | 20±8 pF |
| 1 | 10±4 pF |
| 2 | 30±8 pF |

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(7) Resonant Resistance

| Specification | Resonant resistance |
|---------------|---------------------|
| 1 | 150 Ω |
| 2 | 75 Ω |

(8) User-specific Special Symbols

| Specification | Description |
|---------------|--|
| Name | No specifications, no taping specification |
| — | No specifications, with taping specification |
| A to Z | Serial number for custom design |

(9) Taping Specification

| Specification | Description |
|---------------|------------------------------------|
| R | 16 mm wide emboss tape (3,000 pcs) |

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MARKING

The diagram shows a rectangular marking area containing the text "F 8.00 NMK".

- Fujitsu logo:** Points to the letter "F".
- Frequency (MHz):** Points to the number "8.00".
- Material symbol:** Points to the letter "N". Below it, it says "N: LiNbO₃".
- Lot No. (Date of manufacture, conforms to EIAJ):** Points to the letters "MK".
- Initial frequency deviation:** Points to the letter "K".

Note: The marking color varies with the capacitance of the built-in capacitor.

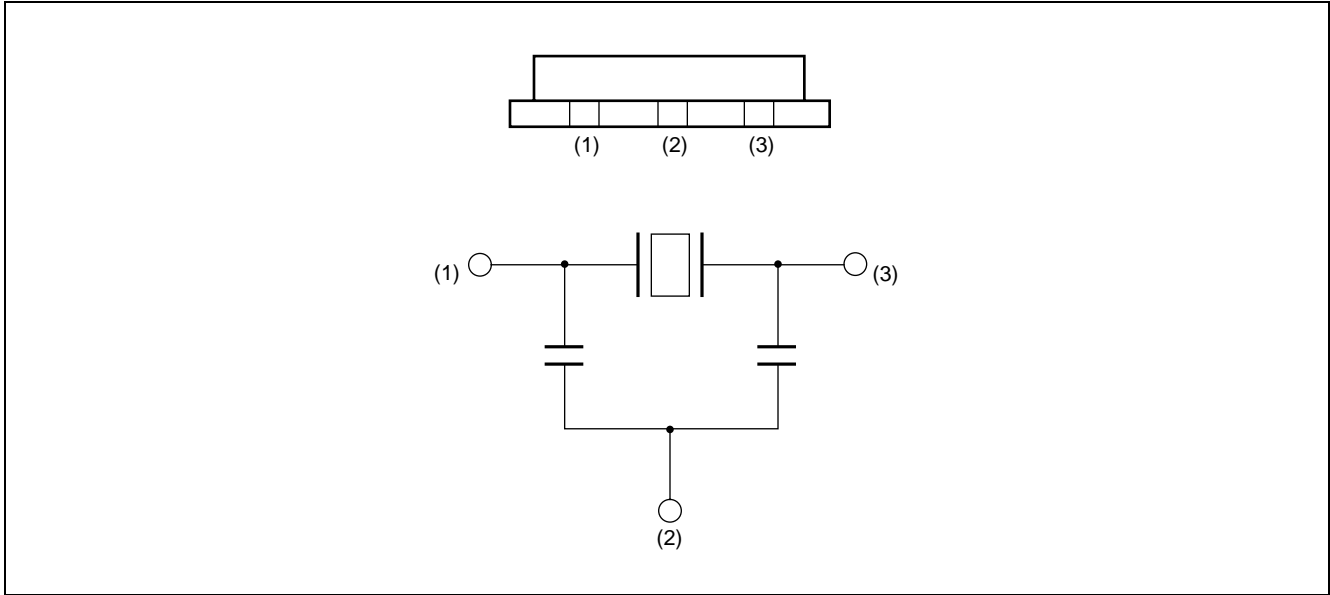
| Capacitance | Marking color |
|-------------|---------------|
| 10 pF | Yellow |
| 20 pF | White |
| 30 pF | Gray |

Data code (EIAJ standard) is specified as follows in four-year cycle.

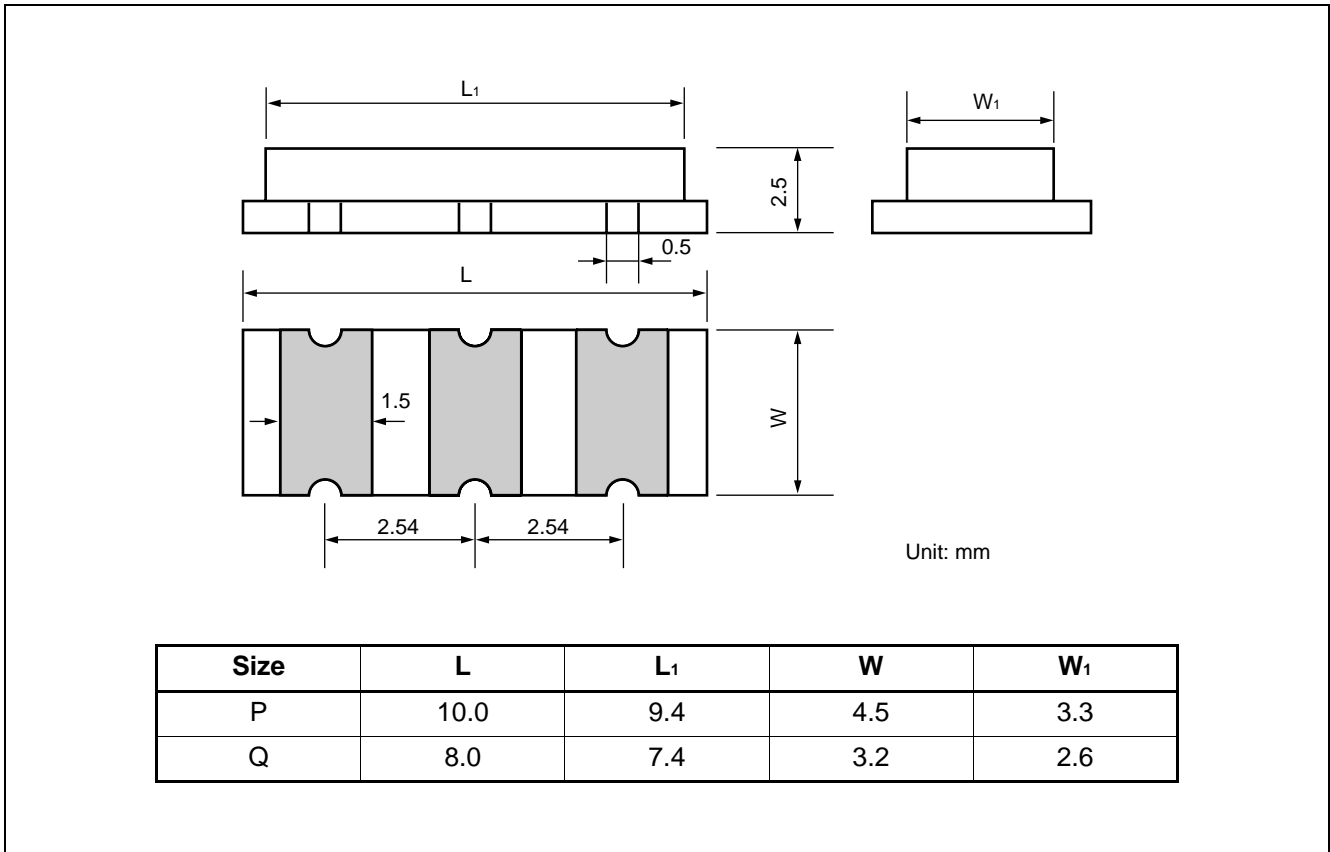
| Year | Month | Symbol | Year | Month | Symbol | Year | Month | Symbol | Year | Month | Symbol |
|--------------|-------|--------|--------------|-------|--------|--------------|-------|--------|--------------|-------|--------|
| 1997 2001 | 1 | A | 1998 2002 | 1 | N | 1999 2003 | 1 | a | 2000 2004 | 1 | n |
| | 2 | B | | 2 | P | | 2 | b | | 2 | o |
| | 3 | C | | 3 | Q | | 3 | c | | 3 | g |
| | 4 | D | | 4 | R | | 4 | d | | 4 | r |
| | 5 | F | | 5 | S | | 5 | e | | 5 | s |
| | 6 | G | | 6 | T | | 6 | f | | 6 | t |
| | 7 | H | | 7 | U | | 7 | g | | 7 | u |
| | 8 | I | | 8 | V | | 8 | h | | 8 | v |
| | 9 | J | | 9 | W | | 9 | j | | 9 | w |
| | 10 | K | | 10 | X | | 10 | k | | 10 | x |
| | 11 | L | | 11 | Y | | 11 | l | | 11 | y |
| | 12 | M | | 12 | Z | | 12 | m | | 12 | z |

FAR Family (C4 series P/Q type)

■ PIN ASSIGNMENT

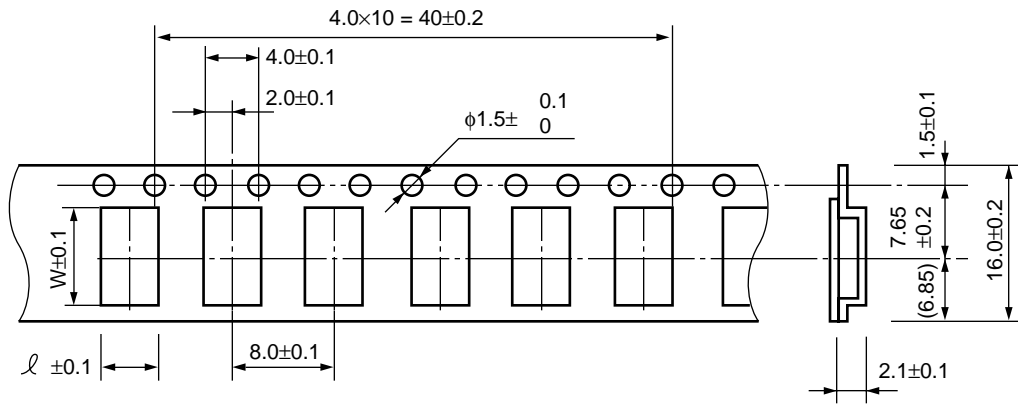


■ DIMENSIONS



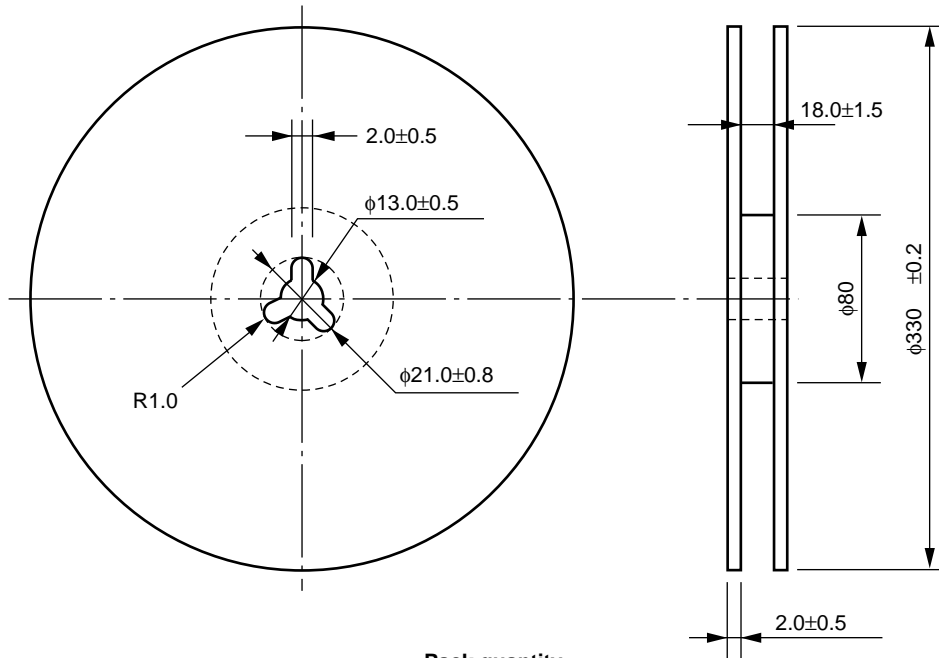
FAR Family (C4 series P/Q type)

■ TAPING FORM AND DIMENSIONS



| Package size | l | W | t |
|--------------|-----|------|-----|
| P | 5.0 | 10.5 | 3.0 |
| Q | 3.7 | 8.5 | 2.8 |

Reel form



• Pack quantity

| Package size | Quantity |
|--------------|----------|
| P, Q | 3,000 |

Unit: mm

FAR Family (C4 series P/Q type)

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